

SEQUENCE LISTING

<110> CONSEJO SUPERIOR DE INVESTIGACIONES CIENTIFICAS  
BIONOSTRA, S.L.

<120> CHIMERIC EMPTY CAPSID OF THE INFECTIOUS BURSAL DISEASE VIRUS (IBDV),  
OBTAINMENT PROCESS AND APPLICATIONS

<130> 7572-73329-01

<140> US 10/579,428

<141> 2006-15-12

<150> ES P200400120

<151> 2004-01-21

<160> 14

<170> PatentIn version 3.1

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 <223> pVP2 ORF

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| tgaattaaag gtccgtatac tccggaatat taatagatca tggagataat taaaatgata  | 180 |  |
| accatctcgc aaataaaataa gtatTTact gtttgcgtaa cagTTTgta ataaaaaaac   | 240 |  |
| ctataaatat tccggattat tcataccgtc ccaccatcgG gCGCGGATCT atg aca     | 296 |  |
| Met Thr  |     |  |
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| ctg atg cca aca acc gga ccg gcg tcc att ccg gac gac acc ctg gag    | 392 |  |
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| Lys His Thr Leu Arg Ser Glu Thr Ser Thr Tyr Asn Leu Thr Val Gly    |     |  |
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| gac aca ggg tca ggg cta att gtc ttt ttc cct gga ttc cct ggc tca    | 488 |  |
| Asp Thr Gly Ser Gly Leu Ile Val Phe Phe Pro Gly Phe Pro Gly Ser    |     |  |
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| att gtg ggt gct cac tac aca ctg cag ggc aat ggg aac tac aag ttc    | 536 |  |
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| Gly Val Thr Val Leu Ser Leu Pro Thr Ser Tyr Asp Leu Gly Tyr Val   |     |     |      |
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| gcc aca tgt gac agc agt gac agg ccc aga gtc tac acc ata act gca   |     |     | 920  |
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| gct gtg gcc gca aac aat ggg ctg acg acc ggc acc gac aac ctt atg   |     |     | 1160 |
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| cca ttc aat ctt gtg att cca aca aac gag ata acc cag cca atc aca   |     |     | 1208 |
| Pro Phe Asn Leu Val Ile Pro Thr Asn Glu Ile Thr Gln Pro Ile Thr   |     |     |      |
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| tcc atc aaa ctg gag ata gtg acc tcc aaa agt ggt ggt cag gca ggg   |     |     | 1256 |
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| acctccccct gaacctgaaa cataaaatga atgcaattgt tgttgttaac ttgtttattg  | 1969 |
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| gacttggttg agtactcacc agtcacagaa aagcatctt cggatggcat gacagtaaga      | 3409 |
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Leu Glu Lys His Thr Leu Arg Ser Glu Thr Ser Thr Tyr Asn Leu Thr  
 35 40 45

Val Gly Asp Thr Gly Ser Gly Leu Ile Val Phe Phe Pro Gly Phe Pro  
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Gly Ser Ile Val Gly Ala His Tyr Thr Leu Gln Gly Asn Gly Asn Tyr  
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| Glu Phe Lys Glu Thr Pro Glu Leu Glu Ser Ala Val Arg Ala Met Glu  |      |
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| cca aag ccc aag cca aaa ccc aat gct cca aca cag aga ccc cct ggt<br>Pro Lys Pro Lys Pro Lys Pro Asn Ala Pro Thr Gln Arg Pro Pro Gly<br>230 | 235 | 240 | 8817 |
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| gtg ccc atc ctg gtc gag ctg gac ggc gac gta aac ggc cac aag ttc<br>Val Pro Ile Leu Val Glu Leu Asp Gly Asp Val Asn Gly His Lys Phe<br>280 | 285 | 290 | 8961 |
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| ctg aag ttc atc tgc acc acc ggc aag ctg ccc gtg ccc tgg ccc acc<br>Leu Lys Phe Ile Cys Thr Thr Gly Lys Leu Pro Val Pro Trp Pro Thr<br>310 | 315 | 320 | 9057 |
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Leu Ser Val Phe Met Trp Leu Glu Glu Asn Gly Ile Val Thr Asp Met  
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Ala Asn Phe Ala Leu Ser Asp Pro Asn Ala His Arg Met Arg Asn Phe  
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Leu Ala Asn Ala Pro Gln Ala Gly Ser Lys Ser Gln Arg Ala Lys Tyr  
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Gly Thr Ala Gly Tyr Gly Val Glu Ala Arg Gly Pro Thr Pro Glu Glu  
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Ala Gln Arg Glu Lys Asp Thr Arg Ile Ser Lys Lys Met Glu Thr Met  
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Gly Ile Tyr Phe Ala Thr Pro Glu Trp Val Ala Leu Asn Gly His Arg  
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Gly Pro Ser Pro Gly Gln Val Lys Tyr Trp Gln Asn Lys Arg Glu Ile  
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Pro Asp Pro Asn Glu Asp Tyr Leu Asp Tyr Val His Ala Glu Lys Ser  
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Arg Leu Ala Ser Glu Glu Gln Ile Leu Arg Ala Ala Thr Ser Ile Tyr  
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Gly Ala Pro Gly Gln Ala Glu Pro Pro Gln Ala Phe Ile Asp Glu Val  
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Ala Lys Val Tyr Glu Ile Asn His Gly Arg Gly Pro Asn Gln Glu Gln  
 195 200 205

Met Lys Asp Leu Leu Leu Thr Ala Met Glu Met Lys His Arg Asn Pro  
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Arg Arg Ala Leu Pro Lys Pro Lys Pro Lys Pro Asn Ala Pro Thr Gln  
 225 230 235 240

Arg Pro Pro Gly Arg Leu Gly Arg Trp Ile Arg Thr Val Ser Asp Glu  
 245 250 255

Asp Leu Glu Gly Ser Ile Ala Thr Met Val Ser Lys Gly Glu Glu Leu  
 260 265 270

Phe Thr Gly Val Val Pro Ile Leu Val Glu Leu Asp Gly Asp Val Asn  
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Gly His Lys Phe Ser Val Ser Gly Glu Gly Glu Gly Asp Ala Thr Tyr  
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| tcgggcgcgg atctcggtcc gaaacc atg tcg tac tac cat cac cat cac cat  |  | 173 |

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| His Asp Tyr Asp Ile Pro Thr Thr Glu Asn Leu Tyr Phe Gln Gly Ala |     |
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| Asn Glu Asp Ser Tyr Val Pro Ser Ala Glu Gln Ile Ala Ala Met Ala |     |
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| Ala Ser Glu Phe Lys Glu Thr Pro Glu Leu Glu Ser Ala Val Arg Ala |     |
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| Met Glu Ala Ala Ala Asn Val Asp Pro Leu Phe Gln Ser Ala Leu Ser |     |
| 60 65 70  |     |
| gtg ttc atg tgg ctg gaa gag aat ggg att gtg act gac atg gcc aac | 413 |
| Val Phe Met Trp Leu Glu Asn Gly Ile Val Thr Asp Met Ala Asn     |     |
| 75 80 85  |     |
| ttc gca ctc agc gac ccg aac gcc cat cgg atg cga aat ttt ctt gca | 461 |
| Phe Ala Leu Ser Asp Pro Asn Ala His Arg Met Arg Asn Phe Leu Ala |     |
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| Asn Ala Pro Gln Ala Gly Ser Lys Ser Gln Arg Ala Lys Tyr Gly Thr |     |
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| Ala Gly Tyr Gly Val Glu Ala Arg Gly Pro Thr Pro Glu Glu Ala Gln |     |
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| agg gaa aaa gac aca cgg atc tca aag aag atg gag acc atg ggc atc | 605 |
| Arg Glu Lys Asp Thr Arg Ile Ser Lys Lys Met Glu Thr Met Gly Ile |     |
| 140 145 150   |     |
| tac ttt gca aca cca gaa tgg gta gca ctc aat ggg cac cga ggg cca | 653 |
| Tyr Phe Ala Thr Pro Glu Trp Val Ala Leu Asn Gly His Arg Gly Pro |     |
| 155 160 165   |     |
| agc cca ggc cag gta aag tac tgg cag aac aaa cga gaa ata ccg gac | 701 |
| Ser Pro Gly Gln Val Lys Tyr Trp Gln Asn Lys Arg Glu Ile Pro Asp |     |
| 170 175 180 185   |     |
| cca aac gag gac tat cta gac tac gtg cat gca gag aag agc ccg ttg | 749 |
| Pro Asn Glu Asp Tyr Leu Asp Tyr Val His Ala Glu Lys Ser Arg Leu |     |
| 190 195 200   |     |
| gca tca gaa gaa caa atc cta agg gca gct acg tcg atc tac ggg gct | 797 |
| Ala Ser Glu Glu Gln Ile Leu Arg Ala Ala Thr Ser Ile Tyr Gly Ala |     |
| 205 210 215   |     |
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|             |             |            |             |            |            |            |            |       |     |     |     |     |     |     |     |      |
|-------------|-------------|------------|-------------|------------|------------|------------|------------|-------|-----|-----|-----|-----|-----|-----|-----|------|
| Pro         | Gly         | Gln        | Ala         | Glu        | Pro        | Pro        | Gln        | Ala   | Phe | Ile | Asp | Glu | Val | Ala | Lys |      |
| 220         |             |            |             |            | 225        |            |            |       |     |     |     | 230 |     |     |     |      |
| gtc         | tat         | gaa        | atc         | aac        | cat        | gga        | cgt        | ggc   | cca | aac | caa | gaa | cag | atg | aaa | 893  |
| Val         | Tyr         | Glu        | Ile         | Asn        | His        | Gly        | Arg        | Gly   | Pro | Asn | Gln | Glu | Gln | Met | Lys |      |
| 235         |             |            |             |            |            | 240        |            |       |     |     | 245 |     |     |     |     |      |
| gat         | ctg         | ctc        | ttg         | act        | gcg        | atg        | gag        | atg   | aag | cat | cgc | aat | ccc | agg | cgg | 941  |
| Asp         | Leu         | Leu        | Leu         | Thr        | Ala        | Met        | Glu        | Met   | Lys | His | Arg | Asn | Pro | Arg | Arg |      |
| 250         |             |            |             |            | 255        |            |            |       |     | 260 |     |     | 265 |     |     |      |
| gct         | cta         | cca        | aag         | ccc        | aag        | cca        | aaa        | ccc   | aat | gct | cca | aca | cag | aga | ccc | 989  |
| Ala         | Leu         | Pro        | Lys         | Pro        | Lys        | Pro        | Lys        | Pro   | Asn | Ala | Pro | Thr | Gln | Arg | Pro |      |
| 270         |             |            |             |            | 275        |            |            |       |     | 280 |     |     |     |     |     |      |
| cct         | ggt         | cg         | ctg         | ggc        | cgc        | tgg        | atc        | agg   | acc | gtc | tct | gat | gag | gac | ctt | 1037 |
| Pro         | Gly         | Arg        | Leu         | Gly        | Arg        | Trp        | Ile        | Arg   | Thr | Val | Ser | Asp | Glu | Asp | Leu |      |
| 285         |             |            | 290         |            |            | 295        |            |       |     |     |     |     |     |     |     |      |
| gag         | tga         | ggatccggaa | ttcaaaggcc  | tacgtcgacg | agctca     | ctag       | tcgcggccgc |       |     |     |     |     |     |     |     | 1093 |
| Glu         |             |            |             |            |            |            |            |       |     |     |     |     |     |     |     |      |
| tttcgaatct  | agagcctgca  | gtctcgaggc | atgcggtacc  | aagcttgc   | agaagtacta |            |            |       |     |     |     |     |     |     |     | 1153 |
| gaggatcata  | atcagccata  | ccacatttgc | agaggtttta  | cttgctttaa | aaaacctccc |            |            |       |     |     |     |     |     |     |     | 1213 |
| acacctcccc  | ctgaacctga  | aacataaaat | aatgcaatt   | gttgggtta  | acttggttat |            |            |       |     |     |     |     |     |     |     | 1273 |
| tgcagcttat  | aatggttaca  | aataaagcaa | tagcatcaca  | aatttcacaa | ataaagcatt |            |            |       |     |     |     |     |     |     |     | 1333 |
| ttttcactg   | cattctagtt  | gtgggttgc  | caaactcatc  | aatgtatctt | atcatgtctg |            |            |       |     |     |     |     |     |     |     | 1393 |
| gatctgatca  | ctagatctgc  | ctaggagatc | cgaaccagat  | aagtgaaatc | tagttccaaa |            |            |       |     |     |     |     |     |     |     | 1453 |
| ctatttgtc   | attttaatt   | ttcgtattag | cttacgacgc  | tacacccagt | tcccatctat |            |            |       |     |     |     |     |     |     |     | 1513 |
| tttgtcactc  | ttccctaaat  | aatccttaaa | aactccattt  | ccacccctcc | cagttcccaa |            |            |       |     |     |     |     |     |     |     | 1573 |
| ctatttgtc   | cgtccacagc  | ggggcatttt | tcttcctgtt  | atgttttaa  | tcaaacatcc |            |            |       |     |     |     |     |     |     |     | 1633 |
| tgccaaactcc | atgtgacaaa  | ccgtcatctt | cggctacttt  | ttctctgtca | cagaatgaaa |            |            |       |     |     |     |     |     |     |     | 1693 |
| attttctgt   | catctcttcg  | ttattaatgt | ttgttaattga | ctgaatatca | acgcttattt |            |            |       |     |     |     |     |     |     |     | 1753 |
| gcagcctgaa  | tggcgaatgg  | gacgcgcct  | gtagcggcgc  | attaagcgcg | gcgggtgtgg |            |            |       |     |     |     |     |     |     |     | 1813 |
| tggttacgcg  | cagcgtgacc  | gtcacacttg | ccagcgcct   | agcgcgcct  | ccttcgcctt |            |            |       |     |     |     |     |     |     |     | 1873 |
| tcttccttc   | cttctcgcc   | acgttcgc   | gtttccccgg  | tcaagctcta | aatcgggggc |            |            |       |     |     |     |     |     |     |     | 1933 |
| tccctttagg  | gttccgattt  | agtgc      | tttac       | ggcacctcga | ccccaaaaaa | cttgattagg |            |       |     |     |     |     |     |     |     | 1993 |
| gtgatggttc  | acgttagtggg | ccatgc     | ccct        | gatagacggt | tttgc      | ccct       | ttgac      | gttgg |     |     |     |     |     |     |     | 2053 |
| agtccacgtt  | cttaatagt   | ggactcttgc | tccaaactgg  | aacaacactc | aaccctatct |            |            |       |     |     |     |     |     |     |     | 2113 |

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| cggcttattc ttttgcattt taaggattt tgccgattt ggcctatttgg ttaaaaaaatg            | 2173 |
| agctgattt aaaaaattt aacgcgaatt ttaacaaaat attaacgttt acaatttcag              | 2233 |
| gtggcacttt tcggggaaat gtgcgcggaa cccctatttgg tttattttc taaatacatt            | 2293 |
| caaataatgtt tccgctcatg agacaataac cctgataaaat gcttcaataa tattgaaaaa          | 2353 |
| ggaagagttt gagtattcaa catttccgttgc tcgccttat tccctttttt gcggcatttt           | 2413 |
| gccttcctgt ttttgcaccc ccagaaacgc tggtaaaatgaaaatgctt gaagatcagt              | 2473 |
| tgggtgcacg agtgggttac atcgaactgg atctcaacag cggttaagatc cttgagagtt           | 2533 |
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| ccacgatgcc tggtagcaatg gcaacaacgt tgcgcacact attaactggc gaactactta           | 2953 |
| ctctagcttc ccggcaacaa ttaatagact ggatggaggc ggataaagttt gcaggaccac           | 3013 |
| ttctgcgttc ggcccttccg gctggctggt ttatttgcataa taaatctggc gcccgtgagc          | 3073 |
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| agattgattt aaaacttcat tttaattttt aaaggatcta ggttaagatc ctttttgata            | 3313 |
| atctcatgac caaaatccct taacgttgcgat tttcggttcca ctgagcgtca gacccgttag         | 3373 |
| aaaagatcaa aggttttttgc tgagatcctt ttttctgcg cgtatctgc tgcttgcggaa            | 3433 |
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| ttccgaaggtaactggcttc agcagagcgc agataccaa tactgtcctt ctagtgcgtc              | 3553 |
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| ctcacatgtt ctccctgcg ttatcccctg attctgtgga taaccgtatt accgccttg     | 4093 |
| agttagctga taccgctcgc cgccagccaa cgaccgagcg cagcgagtca gtgagcgagg   | 4153 |
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| acaataaagt cttaaactag acagaatagt tgtaaactga aatcagtcca gttatgctgt   | 4393 |
| aaaaaaagcat actggacttt tgttatggct aaagcaaaact cttcattttc tgaagtgc当地 | 4453 |
| attgcccgtc gtattaaaga gggcggtggc caagggcatg gtaaagacta tattcgc当地    | 4513 |
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| atttgacttg gtcaggggccg agcctacatg tgc当地atgat gccc当地actt gagccaccta  | 5053 |
| actttgtttt agggcgactg cc当地gtcgta acatcgat gctgctcgat aacatcgat      | 5113 |
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| ttctacggca aggtgc当地gtg cacggatctg cc当地ggcttc aggagatcgg aagacctcg   | 5533 |

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Pro Glu Leu Glu Ser Ala Val Arg Ala Met Glu Ala Ala Ala Asn Val  
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Asp Pro Leu Phe Gln Ser Ala Leu Ser Val Phe Met Trp Leu Glu Glu  
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Asn Gly Ile Val Thr Asp Met Ala Asn Phe Ala Leu Ser Asp Pro Asn  
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Ala His Arg Met Arg Asn Phe Leu Ala Asn Ala Pro Gln Ala Gly Ser  
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Lys Ser Gln Arg Ala Lys Tyr Gly Thr Ala Gly Tyr Gly Val Glu Ala  
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Arg Gly Pro Thr Pro Glu Glu Ala Gln Arg Glu Lys Asp Thr Arg Ile  
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Ser Lys Lys Met Glu Thr Met Gly Ile Tyr Phe Ala Thr Pro Glu Trp  
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Val Ala Leu Asn Gly His Arg Gly Pro Ser Pro Gly Gln Val Lys Tyr  
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Trp Gln Asn Lys Arg Glu Ile Pro Asp Pro Asn Glu Asp Tyr Leu Asp  
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Tyr Val His Ala Glu Lys Ser Arg Leu Ala Ser Glu Glu Gln Ile Leu  
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Arg Ala Ala Thr Ser Ile Tyr Gly Ala Pro Gly Gln Ala Glu Pro Pro

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| Gln Ala Phe Ile Asp Glu Val Ala Lys Val Tyr Glu Ile Asn His Gly |     |     |
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| 245   | 250 | 255 |
| Glu Met Lys His Arg Asn Pro Arg Arg Ala Leu Pro Lys Pro Lys Pro |     |     |
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| Lys Pro Asn Ala Pro Thr Gln Arg Pro Pro Gly Arg Leu Gly Arg Trp |     |     |
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| Ile Arg Thr Val Ser Asp Glu Asp Leu Glu                         |     |     |
| 290   | 295 |     |